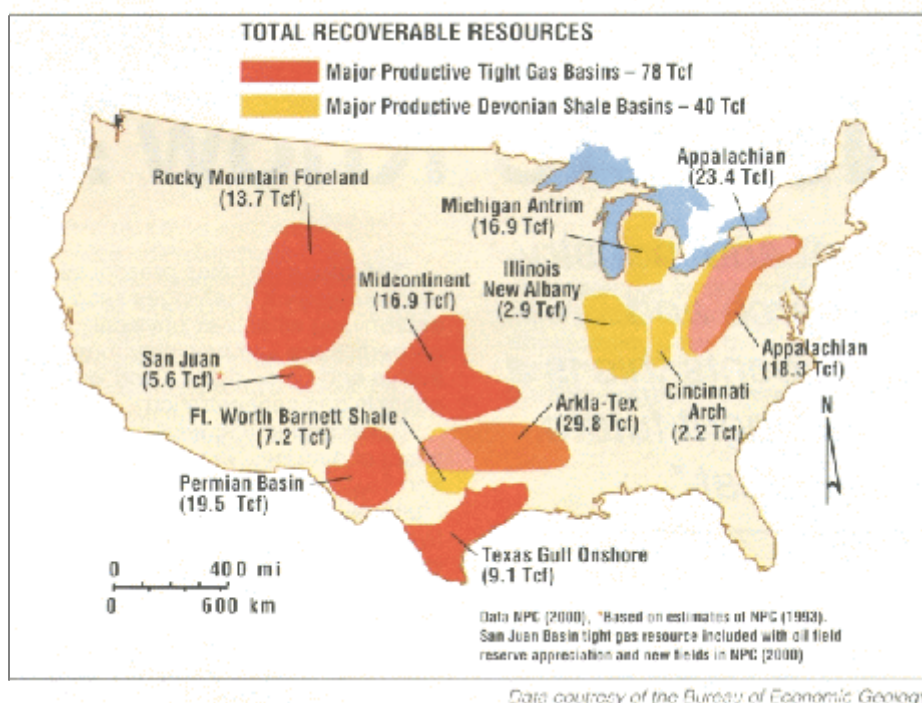


Research, Incentives Needed Gas Faces Unconventional Future

By KATHY SHIRLEY
EXPLORER Correspondent

Figure 1 -Technically recoverable resources for major productive tight gas and Devonian shale basins in the lower 48.



What was once unconventional can become commonplace. Remember when fixing a lunch in a microwave oven was rare?

In the case of natural gas, the unconventional can become as common as the ubiquitous microwave.

What it will take, according to Scott Tinker, director of the Bureau of Economic Geology at the University of Texas at Austin and the Texas state geologist, is a commitment by industry and government to research.

"What is considered unconventional gas today will be the conventional gas of tomorrow - we already have seen that in the production curve," Tinker said.

"Coalbed methane, shale gas and tight gas were not sources of natural gas just 15 to 20 years ago," he said, "but investment in research (by the federal government and private entities) along with incentives to explore for and produce these unconventional resources made these reserves attractive - and consequently new natural gas sources were brought into the mainstream.

"So, with the future rise in natural gas demand and a greater portion of the natural gas production coming from unconventional sources, it is imperative that we create new gas resources through research, technology and incentives."

Tinker stressed the importance of research in meeting America's future needs for natural gas in a paper at the recent annual meeting in Houston, "Fractures, Salt, Seismic and Ice: Vital Research Components of America's Natural Gas Energy Future."

"There are huge sources of natural gas available in North America, but increasingly those reserves will be from unconventional sources like coalbed methane, tight gas, shale gas, deep gas below 15,000 feet, deepwater Gulf of Mexico gas and methane hydrates," Tinker said in a post-convention EXPLORER interview.

"Tight gas, shale gas and coalbed methane now account for approximately 20 percent of U.S. consumption.

Combine these existing unconventional sources with deepwater, subsalt, deep gas, brine gas and gas hydrates, and by 2020 more than 50 percent of U.S. gas consumption will come from unconventional natural gas sources."

Growth Patterns

Tinker pointed out that throughout the past century natural gas was found in association with oil but commonly not explored for as an independent source of energy.

"But during the 21st century the United States will lead the world in transitioning away from coal and oil into methane and hydrogen," he added. "The environmental and efficiency benefits of natural gas and renewable energy sources like nuclear make them attractive, and the number of new natural gas powered electrical generation plants is evidence of the growth cycle we will see in the coming years."

Natural gas provides economic stability compared with oil or coal, he continued.

"Currently, we only import about 15 percent of our natural gas needs versus 57 percent of our oil in the United States, and most of those natural gas imports come from Canada - a stable, friendly ally close to home," he said.

"Along with economic stability comes a national security component to the energy supply that makes natural gas and other renewable energy sources very attractive."

In addition to this growth in demand, resource availability points to a future fueled by natural gas, according to Tinker. Potential future oil reserves are on the decline in the United States, but undiscovered natural gas reserves are still enormous.

However, these new natural gas sources won't come without a price, he said - namely, "a tremendous amount of research to understand how to characterize, quantify and safely drill for and produce those resources.

"And it will take a very different research model than has been historically used to bring new unconventional resources on production," he added, "because the industry has undergone some fundamental changes."

Tangible Benefits

For the most part large, private research laboratories maintained by major oil companies are a distant memory, and those research facilities that do exist within companies are focused more on international targets or research that can pay out in the short-term, he said.

Consequently, the federal government will have to take the lead in future research efforts.

"This new research model will have to have a greater federal component focused on developing research and technology for resources that the private sector is not currently exploring for, such as unconventional natural gas," Tinker said.

That may seem like a simple concept, but there is resistance from both camps that must be overcome.

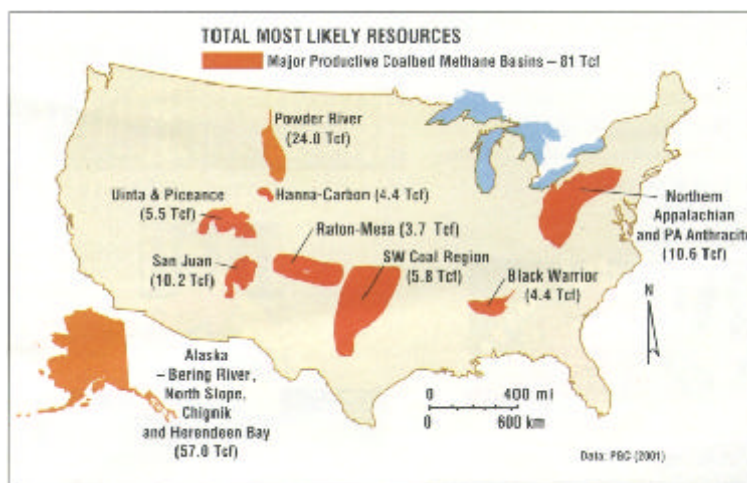
"Traditionally the petroleum industry has preferred minimal government involvement in its business, and that sentiment remains in some sectors today," he said. "Conversely, federal officials need to recognize the game has changed for the private sector and get away from the attitude of 'corporate welfare.'"

"Research undertaken by the federal government would fill a void that is not being addressed by private companies," he said. "Also, the nation will reap a return on this investment through additional capital and royalties paid on those resources."

Plus, there's an energy and environmental benefit for the country.

"We will add resources that would not otherwise be attainable and burn cleaner fuel," he said. "Those are true tangible payoffs that impact the average American citizen."

Figure 2 - Total most likely resources for coalbed methane basins in the lower 48.



Needed: More Infrastructure

Tinker said the infrastructure is in place for the federal government to invest in research and support technology development - but the infrastructure necessary for the country to move toward a natural gas future is not.

There are pipeline and deliverability issues that must be addressed, he said. For example, the deliverability problems experienced in California last year could impact the country on a broader scale and natural gas imports must be explored. It will take government involvement to solve these issues.

"We are importing on the order of billions of cubic feet of gas a year, as LNG, and trillions of cubic feet through pipelines - that's a whole order of magnitude of difference," he said. "The technology is available to expand imports through liquefied natural gas, but it will take a significant ramp up for the private sector to risk investing in LNG.

Tinker said that, based on various reports, gas prices have to be at about \$3.50 to \$4 per thousand cubic feet - and more importantly, stable - before the LNG investment will be made.

"So, some combination of federal incentives and an investment in research and technology in partnership with the private sector must be part of making LNG a vital element in our energy future," he said.

The same is true for unconventional natural gas sources. Tinker said technology will have to be developed in partnership between the private and public sector to tap resources like gas below 15,000 feet, where reservoirs get hot and overpressured, or frozen gas in the Gulf of Mexico or the Arctic.

This is not just an issue for the United States, either. Japan, for example, is banking on methane hydrates, which is a tremendous potential resource for that country.

"In recent years Japan has said it hopes to be an energy exporter in the next three decades because of the nation's gas hydrates potential," Tinker said, "and they are investing in that potential."

These investments in natural gas don't mean the role of oil or coal will diminish as part of the American energy landscape. Tinker said there is a three- to five-decade transition in which current levels of oil and coal consumption will remain steady. However, the substantial growth in energy demand will have to be filled - and that's where natural gas and renewable resources come in.

"We have to invest in that growth reality," he said. "I am a huge believer in conservation, as well, and I think we can do a much better job of conserving our energy resources.

"However, even when you factor in successful conservation issues there is still a large growth demand that has to be met," he said.

"When you look at the production curves for shale gas, coalbed methane and tight sands gas and how those resources were created, we could be having this conversation 20 years from now and be discussing the same type of production curve growth for methane hydrates, deep gas and sub salt reserves - resources that don't exist today," Tinker said.

"Proper investment from - a federal-private sector partnership - can make that future a reality." •

Figure 3 - Major productive deep and deepwater gas basins in the lower 48. Scott Tinker's message is that unconventional gas targets today can be the conventional gas targets of tomorrow, but only if research demands are met.

